

§ 18.50 Protection against external arcs and sparks.

Provision shall be made for maintaining the frames of all off-track machines and the enclosures of related detached components at safe voltages by using one or a combination of the following:

(a) A separate conductor(s) in the portable cable in addition to the power conductors by which the machine frame can be connected to an acceptable grounding medium, and a separate conductor in all cables connecting related components not on a common chassis. The cross-sectional area of the additional conductor(s) shall not be less than 50 percent of that of one power conductor unless a ground-fault tripping relay is used, in which case the minimum size may be No. 8 (AWG). Cables smaller than No. 6 (AWG) shall have an additional conductor(s) of the same size as one power conductor.

(b) A means of actuating a circuit-interrupting device, preferably at the outby end of the portable cable.

NOTE: The frame to ground potential shall not exceed 40 volts.

(c) A device(s) such as a diode(s) of adequate peak inverse voltage rating and current-carrying capacity to conduct possible fault current through the grounded power conductor. Diode installations shall include: (1) An overcurrent device in series with the diode, the contacts of which are in the machine's control circuit; and (2) a blocking diode in the control circuit to prevent operation of the machine with the polarity reversed.

§ 18.51 Electrical protection of circuits and equipment.

(a) An automatic circuit-interrupting device(s) shall be used to protect each ungrounded conductor of a branch circuit at the junction with the main circuit when the branch-circuit conductor(s) has a current carrying capacity less than 50 percent of the main circuit conductor(s), unless the protective device(s) in the main circuit will also provide adequate protection for the branch circuit. The setting of each device shall be specified. For headlight and control circuits, each conductor shall be protected by a fuse or equivalent. Any circuit that is entirely con-

tained in an explosion-proof enclosure shall be exempt from these requirements.

(b) Each motor shall be protected by an automatic overcurrent device. One protective device will be acceptable when two motors of the same rating operate simultaneously and perform virtually the same duty.

(1) If the overcurrent-protective device in a direct-current circuit does not open both lines, particular attention shall be given to marking the polarity at the terminals or otherwise preventing the possibility of reversing connections which would result in changing the circuit interrupter to the grounded line.

(2) Three-phase alternating-current motors shall have an overcurrent-protective device in at least two phases such that actuation of a device in one phase will cause the opening of all three phases.

(c) Circuit-interrupting devices shall be so designed that they can be reset without opening the compartment in which they are enclosed.

(d) All magnetic circuit-interrupting devices shall be mounted in a manner to preclude the possibility of their closing by gravity.

§ 18.52 Renewal of fuses.

Enclosure covers that provide access to fuses, other than headlight, control-circuit, and handheld-tool fuses, shall be interlocked with a circuit-interrupting device. Fuses shall be inserted on the load side of the circuit interrupter.

§ 18.53 High-voltage longwall mining systems.

(a) In each high-voltage motor-starter enclosure, with the exception of a controller on a high-voltage shearer, the disconnect device compartment, control/communications compartment, and motor contactor compartment must be separated by barriers or partitions to prevent exposure of personnel to energized high-voltage conductors or parts. In each motor-starter enclosure on a high-voltage shearer, the high-voltage components must be separated from lower voltage components by barriers or partitions to prevent exposure of personnel to energized high-voltage